

CLASSIFICATION AND SYSTEMATICS OF EASTERN NORTH AMERICAN *VITIS* L. (VITACEAE) NORTH OF MEXICO

MICHAEL O. MOORE

*Botany Department
University of Georgia
Athens, GA 30602, U.S.A.*

ABSTRACT

Eastern North American *Vitis*, north of Mexico, as circumscribed here consists of two subgenera: *Vitis* and *Muscadinia* (Planchon) Rehder. Subgenus *Muscadinia* consists of a single species with two varieties. Subgenus *Vitis* is further divided into five series. Series *Aestivales* and *Cinerecentes* both consist of a single species, the former with three varieties and the latter with four varieties. Series *Cordifoliae*, *Labruscae* and *Ripariae* each contain three species. Three taxa previously recognized as species are regarded as hybrids: *V. × champinii*, *V. × doaniana*, *V. × novae-angliae*. Keys, descriptions, synonymies and typifications are included.

INTRODUCTION

The genus *Vitis* in North America has long been considered difficult from a systematic standpoint and has been largely ignored by North American systematists since the 1930's. The major classifications of North American *Vitis* (Planchon 1887, Munson 1909, Bailey 1934) are discordant in defining species and subgeneric groupings (Barrett et al. 1969), with the latter two treatments being the most widely accepted (Comeaux 1984). Galet (1967) proposed a monograph of the worldwide genus, but his treatment of the North American species is a compilation of the taxa listed by Munson and Bailey with a few minor revisions. The subgeneric groupings proposed by Galet sharply contrast with those proposed by Munson (1909) and Bailey (1934). Indeed, several authors have stated a need for a thorough taxonomic and nomenclatural revision of North American *Vitis* (Brizicky 1965, Radford et al. 1968, McGregor 1986).

Comeaux (1984) represents the most recent classification of North American *Vitis* and is based on Munson's (1909) treatment. However, Comeaux (1984) studied in detail only those taxa native to North Carolina, with the remainder of his classification being derived from a general review of previous literature. Comeaux's (1984) classification was also never published, but rather a different classification was followed by Comeaux et al. in 1987. Several other recent studies have also provided information of im-

port to the systematics of North American *Vitis*, either through the use of experimental studies or as taxonomic treatments of portions of the genus (Barrett et al. 1969, Comeaux 1987a, 1987b, Duncan 1975, Matthews 1960, Moore 1985, 1987, 1988, 1989, Moore and Giannasi 1987). Thus, renewed interest in *Vitis* systematics has resulted in a foundation upon which a modern classification of North American *Vitis* can be structured.

The classification presented here is the result of a revisionary study that employed phenetic analyses of both morphological and foliar flavonoid data as well as extensive field work (Moore 1990). This study, however, excludes the members of series *Occidentales* Munson sensu Munson (1909) and Comeaux (1984) (distributed largely west of the Rocky Mountains) as well as four Mexican and South American members of series *Cinerecentes* and one Mexican member of subgenus *Muscadinia* (sensu Comeaux 1984). The proposed classification is in general agreement with Comeaux's (1984) treatment, but several nomenclatural changes are proposed.

MATERIALS AND METHODS

Herbarium specimens were borrowed from ALU, AUA, BH, BM, C, CM, CU, F, FLAS, FSU, GH, IND, KY, MICH, MINN, MO, MOR, NA, NCU, NHA, NLU, NO, NY, OKL, OKLA, OS, PH, SA, SMU, SRSC, TENN, TEX, TTC, UARK, UNA, UNM, US, USE, VDB, VT, WIS, WVA (acronyms according to Holmgren et al. 1981). All taxa were observed and collected in the field during various trips from 1984–1989. These specimens, along with those housed at GA, were studied during the course of research.

The method by which nodal diaphragm measurements were taken in this study is necessary of brief discussion. In several previous treatments of the genus (e.g., Steyermark 1963; Duncan 1975), the width of nodal diaphragms was used to discriminate between taxa. However, in many such treatments, no indication is given concerning the age of wood from which diaphragm measurements were taken. In wood one year old or older, the nodal diaphragms are frequently wider than in sections made from the current years growth. In this present study, all diaphragm measurements were made from current years growth. Also, measurements were made using a dissecting microscope equipped with an ocular micrometer.

In using the following keys to assist in the identification of the native grapes, emphasis must be placed on the use of combinations of characters, as a single character is frequently insufficient. The morphological variation in the native grapes is considerable, but when several characters are considered, correct identifications can be achieved with little difficulty.

TAXONOMIC TREATMENT

VITIS L. Sp. Pl. 2:230. 1753. — LECTOTYPE: *V. vinifera* L., LINN (as IDC microfiche!).

Deciduous woody vines or viny shrubs climbing by tendrils. Bark exfoliating in strips, lenticels inconspicuous or absent (subgenus *Vitis*) or adherent with prominent lenticels (subgenus *Muscadinia*). Pith brown, interrupted by nodal diaphragms (subgenus *Vitis*) or continuous through nodes (subgenus *Muscadinia*). Tendrils bifid to trifid (subgenus *Vitis*) or unbranched (subgenus *Muscadinia*), present opposite only two consecutive nodes or at three to many consecutive nodes (*V. labrusca*, *V.* \times *novae-angliae*). Branchlets of the season terete to angled, glabrous to densely pubescent. Leaves petiolate, blades simple, lobed or unlobed, palmately veined, cordate to orbicular or reniform, toothed to merely scalloped, often mucronate, bases cordate to less often truncate, glabrous to sparsely or densely pubescent beneath, glabrous to slightly pubescent above. Stipules caducous, 0.5–7 mm long, promptly deciduous. Growing tips glabrous to densely pubescent. Inflorescence thyrsoid-paniculate, present opposite only two consecutive nodes or at three to many consecutive nodes (*V. labrusca*, *V.* \times *novae-angliae*). Flowers pedicellate, functionally unisexual; plants polygamodioecious. Calyx minute, fused into a collar at the base of the flower, essentially absent. Corolla of 5 (3–9) apically united petals, 1–3 mm long, separating basally at anthesis and falling from the plant as a unit. Stamens 5 (3–9), filaments erect in staminate flowers, 2–7 mm long, reflexed to less commonly absent in pistillate flowers; anthers dorsifixed, valvate, introrse, ca. 0.5 mm long. Nectariferous intrastaminal disc of five more or less separate glands alternating with the stamens. Pistil 1, 0.5–2 mm long, ovary 2 (3–4)-locular, each locule with two ovules; style very short; stigma capitate. Fruit a pulpy 1–4 seeded berry. Seeds obovoid to pyriform, 3–8 mm long, the ventral surface with two longitudinal grooves on either side of the attached funiculus (raphe), the dorsal surface with a groove running its length, becoming wider toward the center, forming a circular structure (chalaza) that is either sunken or raised.

Considered in this treatment are 12 species and 9 varieties, distributed throughout the United States and Canada, largely east of the Rocky Mountains. Three hybrid taxa are also found in eastern North America.

KEY TO THE SUBGENERA AND SERIES

1. Tendrils simple; bark adherent with prominent lenticels; pith continuous through nodes Subgenus *Muscadinia*
1. Tendrils bifid to trifid; bark shedding, the lenticels inconspicuous; pith interrupted by diaphragms at nodes 2 (Subgenus *Vitis*)

2. Leaves glaucous beneath; nodes often glaucous Series *Aestruales*
2. Leaves not glaucous beneath; nodes not glaucous 3
3. Branchlets of the season angled, pubescent with arachnoid or hirtellous trichomes, or both, varying to glabrate; mature 3 or 4 seeded berries less than 8 mm in diameter; nodes frequently banded with red pigmentation Series *Cinerecentes*
3. Branchlets of the season more or less terete, glabrous or pubescent; mature 3 or 4 seeded berries usually greater than 8 mm in diameter; nodes usually not banded with red pigmentation 4
4. Leaves heavily arachnoid pubescent beneath, concealing the leaf undersurface but not always the veins; mature fruits greater than 12 mm in diameter Series *Labruscae*
4. Leaves glabrous to slightly arachnoid pubescent beneath, not concealing the intervein area of the underleaf surface; mature berries less than 12 mm in diameter 5
5. Growing tips more or less enveloped by enlarging, unfolding leaves; stipules large, usually greater than 3 mm long; nodal diaphragms usually less than 1 mm in diameter Series *Ripariae*
5. Growing tips not enveloped by enlarging, unfolding leaves; stipules small, usually less than 3 mm long; nodal diaphragms usually greater than 1 mm in diameter .. Series *Cordifoliae*

ARTIFICIAL KEY TO SPECIES AND HYBRIDS

1. Tendrils simple; bark adherent with prominent lenticels; pith continuous through nodes *V. rotundifolia*
1. Tendrils bifid to trifid; bark shredding, the lenticels inconspicuous; pith interrupted by nodal diaphragms 2
2. Mature leaves glaucous beneath; nodes often glaucous *V. aestivalis*
2. Mature leaves not glaucous beneath; nodes not glaucous 3
3. Tendrils or inflorescences present at three to many consecutive nodes 4
4. Leaves densely pubescent beneath, concealing the leaf undersurface but not always the veins; nodal diaphragms usually greater than 1 mm in diameter *V. labrusca*
4. Leaves slightly to moderately pubescent beneath, the leaf undersurface visible on mature leaves; nodal diaphragms usually less than 1 mm in diameter *V. × novae-angliae*
3. Tendrils or inflorescences present at only two consecutive nodes 5
5. Leaves densely pubescent beneath, concealing the leaf undersurfaces but not always the veins; fruits greater than 12 mm in diameter 6
6. Stipules greater than 1 mm long; leaves frequently concavely folded *V. mustangensis*
6. Stipules less than 1 mm long; leaves not concavely folded *V. shuttleworthii*
5. Leaves glabrous to moderately pubescent beneath, the intervein area of leaf undersurfaces visible on mature leaves; fruits less or greater than 12 mm in diameter 7

7. Leaves reniform, glabrous beneath at maturity; tendrils absent or present only opposite the uppermost nodes *V. rupestris*
7. Leaves cordate to cordate ovate, glabrous to pubescent beneath at maturity, tendrils present opposite most nodes 8
8. Nodal diaphragms less than 1 mm wide, usually less than 0.5 mm wide; growing tips enveloped by enlarging, unfolding leaves 9
9. Growing tips slightly to densely pubescent; branchlets of the season slightly to densely arachnoid pubescent; inflorescences usually less than 8 cm long *V. acerifolia*
9. Growing tips glabrous to slightly pubescent; branchlets of the season usually lacking arachnoid pubescence; inflorescences usually greater than 8 cm long *V. riparia*
8. Nodal diaphragms greater than 1 mm wide; growing tips not enveloped by enlarging, unfolding leaves 10
10. Branchlets of the season angled, arachnoid and/or hirtellous pubescent, varying to glabrate; mature 3 or 4 seeded berries less than 8 mm in diameter; nodes frequently banded with red pigmentation *V. cinerea*
10. Branchlets of the season more or less terete, glabrous or arachnoid pubescent; mature 3 or 4 seeded berries usually greater than 8 mm in diameter; nodes usually not banded with red pigmentation 11
11. Mature 3 or 4 seeded berries greater than 12 mm in diameter; leaves arachnoid pubescent beneath 12
12. Leaves moderately to heavily arachnoid pubescent beneath, also with hirtellous trichomes along the veins; fruits glaucous *V. × doaniana*
12. Leaves only slightly arachnoid pubescent beneath and lacking hirtellous trichomes; fruits not glaucous *V. × champinii*
11. Mature 3 or 4 seeded berries less than 12 mm in diameter; leaves usually lacking arachnoid pubescence beneath 13
13. Nodal diaphragms greater than 2.5 mm wide; leaf apices usually long acuminate; branchlets of the season with a purplish red cast *V. palmata*
13. Nodal diaphragms less than 2.5 mm wide; leaf apices usually acute to short acuminate; branchlets of the season gray to green or brown or with purplish pigmentation only on one side of the branchlet 14
14. Berries usually with lenticels; infructescences with less than 12 berries; growing tips slightly to densely pubescent; leaf blades usually less than 8 cm

- long; branchlets of the season usually slightly arachnoid pubescent *V. monticola*
 14. Berries without lenticels; infructescences with more than 12 berries; growing tips glabrous to slightly pubescent; leaf blades usually greater than 9 cm long; branchlets of the season glabrous *V. vulpina*

Subgenus **MUSCADINIA** (Planchon) Rehder, Man. Cult. Trees 601.

1927. Section *Muscadinia* Planchon, DC Monogr. Phan. 5:323. 1887. Genus *Muscadinia* (Planchon) Small, Fl. SE U.S. 756. 1903. — TYPE SPECIES: *V. rotundifolia* Michaux.

VITIS ROTUNDIFOLIA Michaux, Fl. Bor.-Amer. 2:231. 1803.

High climbing vine, branchlets of the season terete to slightly angled. Bark of younger woody stems with evident lenticels, that of older stems tight, not exfoliating, that of still older stems exfoliating in plates, pith brown, continuous through nodes, diaphragm absent. Tendrils unbranched, a tendril or inflorescence present at only 2 consecutive nodes, nodes not glaucous, but often banded with red pigmentation. Very young, rapidly growing stems and leaf surfaces usually with thin, loose, grayish arachnoid pubescence or with dense, rusty, arachnoid pubescence at the nodes of the stems and pinkish on leaf surfaces, the pubescence eventually deciduous. Leaves with petioles mostly as long as the blades, glabrous to glabrate; blades cordiform to nearly reniform, very rarely lobed; margins crenate to dentate, apices very short acuminate; upper surface of mature leaves glabrous and lustrous, lower surface not glaucous, but glabrous or pubescent with few to many hirtellous trichomes along the veins and in their axils; stipules 1–2 mm long. Panicles 3–8 cm long, rarely longer, usually more or less globose in outline, infructescences with less than 25 berries (or pedicels); 3 or 4 seeded berries 8–25 mm in diameter, generally black or purplish, occasionally bronze when ripe, glaucescent, with tan, circular lenticels present on the skin. Seeds brown, oval to ellipsoidal, 5–8 mm long.

Inhabiting a very wide variety of sites, both upland and well drained and lowland and poorly drained, including intermittently flooded bottomlands. (DE to KY, s IN, MO, generally southward to FL, e OK and e TX). Flowering in late April to May; fruit ripening in late July to September.

The two varieties of this species can be distinguished morphologically based on the following key:

1. Mature fruits greater than 12 mm in diameter; infructescences usually with less than 12 berries; leaf blades usually more than 5 cm in length
 *V. rotundifolia* var. *rotundifolia*

1. Mature fruits less than 12 mm in diameter; infructescences with more than 12 berries; leaf blades often less than 5 cm long *V. rotundifolia* var. *munsoniana*

VITIS ROTUNDIFOLIA Michaux var. **ROTUNDIFOLIA**. *V. muscadinia* Raf., Amer. Man. Grape Vines 16–17. 1830. *Muscadinia rotundifolia* (Michaux) Small, Fl. SE U.S. 757. 1903. — TYPE: a Virginia ad Floridum (LECTOTYPE, here designated: microfiche IDC Michaux, no. 122, photo 20! P). — SYNTYPE: microfiche IDC Michaux, no. 123, photo 1! (P).

Leaves generally larger than in variety *munsoniana*, fruits greater than 12 mm in diameter and infructescences with less than 12 berries. Inhabiting a wide variety of sites, both upland and well drained and lowland and poorly drained. (DE to KY, s IN, MO, generally southward to FL, e OK and e TX). Flowering in late April to May, fruit ripening in late July to September.

Representative specimens examined: ARKANSAS. Hempstead Co.: *Palmer* 6839 (GH). GEORGIA. Brooks Co.: *Moore* 790 (GA); Clarke Co.: *Moore* 1011 (GA). FLORIDA. Franklin Co.: *Moore* 814 (GA); Gilchrist Co.: *Moore* 407 (GA); Jackson Co.: *Knight* 675 (FSU). NORTH CAROLINA. Davie Co.: *Moore* 249 (GA). OKLAHOMA. LeFlore Co.: *Palmer* 20589 (GH). SOUTH CAROLINA. Berkeley Co.: *Wiegand & Manning* 1955 (GH). TEXAS. Newton Co.: *Lundell* 11870 (TX).

VITIS ROTUNDIFOLIA Michaux var. **MUNSONIANA** (Simpson ex Munson) M.O. Moore, comb. nov. — BASIONYM: *V. munsoniana* Simpson ex Munson, Proc. Soc. Promot. Agric. Sci. 8:59. 1887. *Muscadinia munsoniana* (Simpson ex Munson) Small, Fl. SE U.S. 757. 1903. — TYPE. FLORIDA. MANATEE CO.: collected along Manatee River, 1883, 1885, 1887, *J.H. Simpson*, cultivated Munson vineyard, Denison, Texas 1890 (LECTOTYPE, here designated: PH!). — SYNTYPE: (PH!).

Similar to var. *rotundifolia*, but usually with smaller leaves, fruits less than 12 mm in diameter and infructescences with more than 12 berries. Inhabiting a wide variety of sites, but usually found on drier soils. (FL, s GA, s AL). Flowers and fruits virtually all year in peninsular Florida, but in more northern locations flowering in late April to May; fruit ripening late July to September.

Representative specimens examined: FLORIDA. Collier Co.: *Moore* 764 (GA); *Moore* 759 (GA). Duval Co.: *Curtis* 4818 (US). Franklin Co.: *Moore* 815 (GA). Highlands Co.: *Skean* 2144 (GA). Lake Co.: *Moore* 401 (GA); *Judd* 2453B (FLAS). Monroe Co.: *Bailey* 314 (BH); *Moore* 769 (GA). Putnam Co.: *Moore* 746 (GA).

Subgenus **VITIS**, Series **AESTIVALES** Planchon, in DC Monogr. Phan. 5:323. 1887. — TYPE SPECIES: *V. aestivalis* Michaux.

VITIS AESTIVALIS Michaux, Fl. Bor.-Amer. 2:230. 1803.

High climbing vine, branchlets of the season terete, tomentose, arach-

noid floccose or glabrous. Bark exfoliating in shreds on mature stems, lenticels absent or inconspicuous, pith brown, interrupted by diaphragms at the nodes, diaphragms 1–4 mm thick. Tendrils bifurcate, a tendril or inflorescence present at only 2 consecutive nodes, nodes glaucous or not glaucous, not banded with red pigmentation. Leaves with petioles about as long as the blades, glabrate to pubescent; blades cordiform to orbicular, unlobed to 3-shouldered or 3–5 lobed, often deeply so, when lobed the lobes mostly acute, the sinuses rounded to acute; margins crenate to dentate; upper surface of mature leaves glabrous to puberulent, lower surface glaucous with varying degrees of arachnoid, floccose pubescence, when heavy the glaucescence somewhat obscured, the pubescence whitish to more commonly rusty, hirtellous trichomes also occasionally present along the veins and as tufts in the vein axils; stipules 1–4 mm long. Panicles 7–20 cm long, usually narrowly triangular in outline, infructescences usually with more than 25 berries (or pedicels); 3 or 4 seeded berries 8–20 mm in diameter, black, glaucous, without lenticels. Seeds tan to brown, pyriform, 3–8 mm long.

Generally found on well drained sites, woodlands of various mixtures, woodland borders, thickets, fence and hedge rows, scrub, stabilized dunes, less often along stream or river banks, rarely in floodplains or lowland woods. (Throughout eastern North America and southern Canada). Flowering in April to June; fruit ripening in July to September.

This species is frequently confused with *V. cinerea*. However, the glaucous leaf undersurfaces, more heavily glaucous, larger berries, terete less evenly pubescent branchlets, preference for well drained, drier habitats and earlier blooming period distinguishes *V. aestivalis* from *V. cinerea*.

The three varieties of this species can be distinguished morphologically based on the following key:

1. Branchlets of the season heavily arachnoid pubescent; mature 3 or 4 seeded berries usually greater than 14 mm in diameter; stipules usually less than 1.5 mm long *V. aestivalis* var. *linceumii*
1. Branchlets of the season slightly to moderately arachnoid pubescent, or glabrous; mature 3 or 4 seeded berries usually less than 14 mm in diameter; stipules usually greater than 1.5 mm long 2
2. Mature 3 or 4 seeded berries less than 9 mm in diameter; mature leaves glabrous to glabrate beneath; nodes usually glaucous; nodal diaphragms usually less than 2 mm in diameter *V. aestivalis* var. *bicolor*
2. Mature 3 or 4 seeded berries greater than 9 mm in diameter; mature leaves slightly to heavily arachnoid pubescent beneath; nodes usually not glaucous; nodal diaphragms usually greater than 2 mm in diameter *V. aestivalis* var. *aestivalis*

VITIS AESTIVALIS Michaux var. **AESTIVALIS**. *V. labrusca* var. *aestivalis* (Michaux) Regel, Act. Hort. Petrop. 2:396. 1873. *V. vinifera* var. *aestivalis* (Michaux) Kunze, Rev. Gen. Pl. 1:132. 1891. — TYPE: in sylvestris, a Pennsylvania ad Carolinum (LECTOTYPE, here designated: microfiche IDC Michaux, no. 122, photo 17! P). — SYNTYPE: microfiche IDC Michaux, no. 122, photo 18! (P).

V. aestivalis var. *sinuata* Pursh, Fl. Amer. Sept. 1:169. 1814. *V. sinuata* (Pursh) G. Don, Gen. Hist. 1:711. 1831. — SYNTYPES: not seen.

V. araneosus LeConte, Proc. Acad. Nat. Sci. Philadelphia 6:272. 1853. — TYPE: GEORGIA. On the banks of the Oconee at Athens, 14 Sep 1850, *John LeConte s.n.* (LECTOTYPE, here designated: PH!; ISOLECTOTYPE: PH!). — SYNTYPES: (PH!).

V. linccumii Buckley var. *glauca* Munson, U.S.D.A. Div. Pomol. Bull. No. 3: 7, 12. 1890. *V. linccumii* var. *lactea* Small, Fl. SE U.S. 755, 1334. 1903. — TYPE: TEXAS. North Texas, 26 May 1890, *Munson s.n.* (HOLOTYPE: PH!).

V. simpsonii Munson, U.S.D.A. Div. Pomol. Bull. No. 3:12. 1890, non 1887, *nom. illeg.* *V. smalliana* Bailey, Gentes Herb. 3:207–209. 1934. *V. aestivalis* ssp. *smalliana* (Bailey) Rogers, Proc. Florida State Hort. Soc. 92:289. 1979, *nom. illeg.* *V. aestivalis* var. *smalliana* (Bailey) Comeaux, Sida 12:286. 1987. — TYPE: FLORIDA. MANATEE Co.: collected originally from Manatee County, n.d., *J.H. Simpson s.n.* cultivated Denison, Texas, 25 May 1890 (LECTOTYPE, here designated: PH!; ISOLECTOTYPES: MO!).

V. rufotomentosa Small, Fl. SE U.S. 756, 1334. 1903. — TYPE: FLORIDA. LAKE Co.: vicinity of Lake Eustis, 16–30 Apr 1894, *Nash 525* (HOLOTYPE: NY!; ISOTYPES: US!, PH!).

V. gigas Fennel, J. Wash. Acad. Sci. 30:15–19. 1940. — TYPE: FLORIDA. Sebastian River, 20 Jul 1938, *J.L. Fennel 713* (HOLOTYPE: US!; 2 sheets, 1 of fruiting branch, 1 of growing tip).

Leaf undersurfaces with varying degrees of arachnoid pubescence, moderately to somewhat heavily glaucous, nodes usually not glaucous, nodal diaphragms usually greater than 2 mm wide, mature 3 or 4 seeded berries 9–14 mm in diameter. Found in well drained sites, woodlands, woodland borders, thickets, fence and hedge rows, scrub, stabilized dunes, less often along stream or river banks and floodplains and lowland woods. (Piedmont, Coastal Plain, Mountains, Interior Low Plateau, Central Lowlands, coastal MA to se IA, MO, e OK, e TX to FL). Flowering in April to June, fruit ripening in July to September.

Representative specimens examined: FLORIDA. Hamilton Co.: *Moore 379* (GA). Hampton Co.: *Moore 360* (GA). Wakulla Co.: *Moore 403* (GA). GEORGIA. Decatur Co.: *Moore 805* (GA). Montgomery Co.: *Moore 346* (GA). INDIANA. Martin Co.: *Moore 1056* (GA). MISSOURI. Howell Co.: *Moore 1027* (GA). TENNESSEE. Carter Co.: *Moore 250* (GA). TEXAS. Rusk Co.: *Moore 930* (GA). VIRGINIA. Nelson Co.: *Moore 834* (GA).

VITIS AESTIVALIS Michaux var. **BICOLOR** Deam, Shrubs Indiana 207. 1924. *V. argentifolia* Munson, Proc. Soc. Promot. Agric. Sci. 8:59. 1887. *V. aestivalis* var. *argentifolia* (Munson) Fernald, Rhodora 38:428. 1936. — NEOTYPE, here designated: WEST VIRGINIA. NICHOLAS Co.: W side of US 19, 1.7 mi S of the

Braxton Co. line, 12.3 mi N of jct. with WV 55, 25 Aug 1987, Michael O. Moore 886 (GA!). — SYNTYPES: not found.

Similar to var. *aestivalis*, but with leaf undersurfaces glabrous to glabrate and heavily glaucous beneath, nodes usually glaucous, nodal diaphragms only 1–2 mm wide, mature 3 or 4 seeded berries 8–9 mm in diameter.

Inhabiting a wide variety of well drained sites, woodlands of various mixtures, woodland borders, thickets, fence and hedge rows and scrub. (Blue Ridge, Ridge and Valley, Appalachian Plateau, n GA and n AL generally north to Canada). Flowering in late May to June; fruit ripening in July to September.

Previously known as *V. aestivalis* var. *argentifolia*, Fernald (1936), stated that the name var. *bicolor* cannot be used because this taxon is not the *V. bicolor* of LeConte and because var. *bicolor* was never published. However, Deam (1924) did treat this taxon as *V. aestivalis* var. *bicolor*, attributing the combination to Britton and Brown. Britton and Brown never made this combination, but rather listed *V. bicolor* in synonymy under *V. aestivalis*. LeConte's *V. bicolor* is a dubious name that cannot be associated with any currently recognized taxon. Deam (1924) did give a good description of this taxon including characters that distinguish it from *V. aestivalis* var. *aestivalis* and thus did feel that it should be treated as a variety of *V. aestivalis*. It can thus be concluded that Deam's use of the name *V. aestivalis* var. *bicolor* is a valid publication which has priority over Fernald's (1936) name *V. aestivalis* var. *argentifolia*.

Representative specimens examined: CONNECTICUT. Hartford Co.: Moore 851 (GA). GEORGIA. Rabun Co.: Owen 201 (AUA). ILLINOIS. Tazewell Co.: Chase 3467 (MIN). KENTUCKY. Bell Co.: McFarland 3619 (BH). NORTH CAROLINA. Avery Co. Moore 254 (GA). OHIO. Ashtabula Co.: Tandy 1741 (OS). PENNSYLVANIA. Northampton Co.: Adams 4128 (GH). VIRGINIA. Patrick Co.: Moore 232 (GA). WEST VIRGINIA. Nicholas Co.: Moore 886 (GA). WISCONSIN. Columbia Co.: Allen s.n. (MIN).

VITIS AESTIVALIS VAR. LINCUMII (Buckley) Munson, Proc. Amer. Pomol.

Soc. 20:97. 1886. *V. linceumii* Buckley, Proc. Acad. Nat. Sci. Philadelphia 62: 451. 1861. — TYPE: TEXAS. Eastern Texas, 1861, S.B. Buckley s.n. (HOLOTYPE: US!).

Similar to var. *aestivalis*, but with branchlets of the season more or less densely tomentose, nodal diaphragms generally less than 2 mm wide, leaves more frequently deeply 3 to 5 lobed, berries that are generally larger than 14 mm in diameter and are heavily glaucous, and larger seeds, 7–8 mm. *Vitis aestivalis* var. *linceumii* also has an earlier time of anthesis than var. *aestivalis* and is more drought resistant.

Inhabiting well drained sites, woodlands of various mixtures, woodland borders, thickets, fence and hedge rows and scrub. (TX, east of the Trinity

River, c TX east of Austin, w LA). Flowering in April, fruit ripening June to September.

In the original publication of this name (Buckley 1861), the specific epithet was spelled "*linsecumii*", but the holotype has the name spelled "*linceumii*" in Buckley's handwriting. Munson (1909) determined that this taxon was named after Dr. Gideon Linceum, and speculated that the spelling "*linsecumii*" probably came through as an error of the typesetter. Thus, in accordance with article 73.1 of the International Code of Botanical Nomenclature, the spelling of this name should be corrected to "*linceumii*."

Representative specimens examined: LOUISIANA. Bienville Parish. *Moore* 664 (GA). TEXAS. Cherokee Co.: *Moore* 931 (GA). Henderson Co.: *Landell & Landell* 9569 (SMU). Leon Co.: *Moore* 936 (GA). Milam Co.: *Moore* 680 (GA). Morris Co.: *Correll & Correll* 12445 (SMU); *Correll & Correll* 25469 (NY). Rusk Co.: *Cory* 56465 (SMU). Smith Co.: *Shinners* 15094 (SMU). Wood Co.: *Holmes* 3917 (NLU).

Subgenus **VITIS**, Series **CINERESCENTES** Planchon, in DC Monogr.

Phan. 5:323. 1887. — TYPE SPECIES: *V. cinerea* (Engelm. in Gray) Engelm. ex Millardet.

VITIS CINEREA (Engelm. in Gray) Engelm. ex Millardet, Mem. Soc. Sci. Phys. Nat. Bordeaux 2(3):319–330. 1880.

High climbing vine in floodplains and lowland woods, along stream banks, pond margins and fence rows. Branchlets slightly to distinctly angled (the angling often difficult to see with the unaided eye), branchlets of the season covered with dense, short, straight (hirtellous) trichomes and/or thin to dense arachnoid pubescence, varying to glabrate. Bark exfoliating in shreds on mature stems, lenticels absent or inconspicuous, pith brown, interrupted by diaphragms at nodes, diaphragms 1.5 to 3.5 mm thick. Tendrils bifurcate to trifurcate, a tendril or inflorescence present at only 2 consecutive nodes, nodes of branchlets of the season often banded with red pigmentation, nodes not glaucous. Leaves with petioles about as long as the blades, puberulent to pubescent with hirtellous trichomes, thin arachnoid pubescence commonly present as well; blades cordiform, unlobed to 3-shouldered, occasionally 3-lobed, the apex acute to more commonly acuminate; margins crenate to dentate; upper surface of mature leaves glabrous to pubescent, lower surface not glaucous, slightly to moderately arachnoid pubescent, varying to glabrous, the pubescence mostly whitish; hirtellous trichomes also commonly present along the veins and as small tufts in the vein axils; stipules 1–3 mm long. Panicles 10–25 cm long, usually broadly triangular in outline, infructescences usually with more than 25 berries (or pedicels); 3 or 4 seeded berries 4–8 mm in diame-

ter, black, with little or no glaucescence, lenticels absent. Seeds brown, obovoid, 2–4 mm long.

Usually found in moist habitats. (s IN to s PA, south to FL, west to TX, north to OK, KN, MO and IL). Flowering in late May to June; fruit ripening in July to October. This species is frequently confused with *V. aestivalis*. See the discussion provided under *V. aestivalis*.

In recent treatments of the genus (e.g., Radford *et al.* 1968; Godfrey and Wooten 1981), the author citation for *V. cinerea* is given as Engelm. ex Millardet. Still other treatments (e.g., Streyermark 1963; McGregor 1986) cite only Engelm. as the author citation. Gandhi and Brown (1989), however, use the following: *V. cinerea* (Engelm.) Engelm. ex Millardet and discuss the reasoning for their citation of authorship. Since this taxon was first published as a variety of *V. aestivalis* in Gray's Manual (1867), with the name being attributed to and the description provided by Engelmann, it is clear that the initial citation should be *V. aestivalis* var. *cinerea* Engelm. in Gray. Millardet was the first to elevate this taxon to the species level, also attributing the name to Engelmann but providing a description not given by Engelmann. Thus, the correct citation is clearly *V. cinerea* (Engelm. in Gray) Engelm. ex Millardet. To eliminate Gray's name from the author citation also eliminates the author of the original publication in which the name appeared from the citation, making it quite difficult to trace the nomenclatural history of this taxon.

The four varieties of this species can be distinguished morphologically based on the following key:

- 1. Berries moderately to heavily glaucous; leaf blades glabrous to glabrate, usually less than 10 cm long; central Texas *V. cinerea* var. *belleri*
- 1. Berries only slightly to not glaucous; leaf blades pubescent, varying to glabrate, usually more than 10 cm long; e Texas east and northward 2
- 2. Branchlets of the season sparsely to densely hirtellous pubescent, often with arachnoid pubescence as well; leaf undersurfaces usually more or less uniformly hirtellous pubescent on veins *V. cinerea* var. *cinerea*
- 2. Branchlets of the season without evident hirtellous trichomes (if present, then concealed by arachnoid pubescence); leaf undersurfaces usually without hirtellous trichomes, or, when present, only very sparsely so 3
- 3. Branchlets slightly to densely arachnoid pubescent; nodes usually not banded with red pigmentation; leaves slightly to densely arachnoid pubescent beneath; Coastal Plain *V. cinerea* var. *floridana*
- 3. Branchlets glabrate to only slightly arachnoid pubescent; nodes usually banded with red pigmentation; leaves glabrous to very slightly arachnoid pubescent beneath; Piedmont and Mountains *V. cinerea* var. *baileyana*

VITIS CINEREA (Engelm. in Gray) Engelm. ex Millardet var. **CINEREA**. *V. aestivalis* var. *cinerea* Engelm. in Gray, Manual ed. 5:676. 1867. — TYPE: ILLINOIS. The Engelmann farm, Sep 1867, *G. Engelmann s.n.* (LECTOTYPE, here designated: MO!; ISOLECTOTYPE: MO!). — SYNTYPE: (MO!).

V. cinerea var. *canescens* (Engelm.) Bailey ex Gray, Syn. Fl. N. Amer. 1(2):425. 1897. *V. aestivalis* var. *canescens* Engelm., Amer. Naturalist 2:321. 1869. — TYPE: Mississippi Valley (HOLOTYPE: GH!).

Branchlets of the season covered with short, straight hirtellous trichomes, occasionally with arachnoid trichomes as well. Leaf undersurfaces are moderately arachnoid and/or hirtellous pubescent. Inhabiting floodplains, lowland woods, ponds and stream margins. Native to the rich bottomlands of the Mississippi basin. (s IA, s IL, s IN south to e KN, e OK, e TX east to a few scattered localities in AL and panhandle FL). Flowering in late May to June, fruit ripening in July to October.

Representative specimens examined: ALABAMA. Lowndes Co.: *Moore* 734 (GA). ARKANSAS. Ashley Co.: *Moore* 349 (GA). Marion Co.: *Moore* 300 (GA). ILLINOIS. Richland Co.: *Moore* 1053 (GA); Schuyler Co.: *Moore* 1047 (GA). KENTUCKY. Hickman Co.: *Moore* 284 (GA). LOUISIANA. Bossier Parish. *Moore* 335 (GA). MISSISSIPPI. Lowndes Co.: *Moore* 344 (GA). OKLAHOMA. Pottawatomie Co.: *Moore* 982 (GA). TENNESSEE. Lake Co.: *Moore* 278 (GA).

VITIS CINEREA (Engelm. in Gray) Engelm. ex Millardet var. **FLORIDANA** Munson, U.S.D.A. Div. Pomol. Bull. No. 3:12. 1890. *V. simpsonii* Munson, Proc. Soc. Promot. Agric. Sci. 8:59. 1887. *V. austrina* Small, Fl. SE U.S. 755. 1903. — TYPE: FLORIDA. MANATEE Co.: originally from Manatee River, *J.H. Simpson s.n.*, cultivated in vineyard of T.V. Munson, 1890 (LECTOTYPE, here designated: MO!; ISOLECTOTYPE: MO!). — SYNTYPES: (BH!, PH!).

V. sola Bailey, Gentes Herb. 3:203. 1934. *V. aestivalis* ssp. *sola* (Bailey) Rogers, Proc. Florida State Hort. Soc. 92:289. 1979, *nom. illeg.* — TYPE: FLORIDA. Swamp near Jacksonville, 20 Sep 1894, *A.H. Curtiss* 4791 (LECTOTYPE, here designated: NY!, as photo BH!; ISOLECTOTYPE: NY!). — PARATYPES: (MO!, as photo BH!).

V. aestivalis ssp. *divergens* Rogers, Proc. Florida State Hort. Soc. 92:289. 1979, *nom. illeg.*

Similar in general appearance to *V. cinerea* var. *cinerea* but differs from var. *cinerea* by having branchlets that are arachnoid pubescent, often densely so, and generally lacking the dense hirtellous pubescence characteristic of *V. cinerea* var. *cinerea*. The leaf undersurfaces of *V. cinerea* var. *floridana* also tend to be more densely arachnoid pubescent than is common in *V. cinerea* var. *cinerea*. Common in floodplains, lowland woods, stream and pond margins. (Coastal Plain of VA, SC, NC, GA, FL, AL and MS). Flowering in late May to June; fruit ripening in July to October. This variety is frequently confused with *V. aestivalis*. See the discussion provided under *V. aestivalis*.

Comeaux and Fantz (1987) provide a discussion of the somewhat convoluted nomenclatural history of this taxon.

Representative specimens examined: ALABAMA. Lowndes Co.: *Moore* 732 (GA). FLORIDA. Collier Co.: *Moore* 763 (GA). Gadsden Co.: *Moore* 804 (GA). Jefferson Co.: *Moore* 391, (GA). Taylor Co.: *Moore* 402 (GA). Walton Co.: *Moore* 202 (GA). GEORGIA. Early Co.: *Moore* 261 (GA). Randolph Co.: *Moore* 268 (GA). Telfair Co.: *Moore* 382 (GA). Wilkinson Co.: *Moore* 381 (GA).

VITIS CINEREA (Engelm. in Gray) Engelm. ex Millardet var. **BAILEYANA** (Munson) Comeaux, *Castanea* 52(3):212–213. 1987. *V. virginiana* Munson, U.S.D.A. Div. Pomol. Bull. No. 3:3, 14. 1890, *nom. illeg.* *V. baileyana* Munson, Leaflet, 20 Jun 1893. — TYPE: VIRGINIA. ROANOKE CO.: Mountain valleys, southwest Virginia, 1890, *J.G. Wertz s.n.* (LECTOTYPE, here designated: PH!; ISOLECTOTYPE: MO!).

Similar in general appearance to *V. cinerea* var. *floridana*, but differing in having branchlets of the season glabrous to glabrate, nodes usually banded with red pigmentation and lower leaf surfaces glabrous to glabrate. Inhabiting a variety of habitats but more common in moist soils, floodplains, lowland woods, stream and pond margins. (Piedmont and Mountains, GA and AL to se IN, s OH and s PA). This taxon intergrades into *V. cinerea* var. *floridana* along the fall line between the Piedmont and Coastal Plain in AL, GA, NC, SC and VA.

Representative specimens examined: GEORGIA. Clarke Co.: *Moore* 171 (GA); *Moore* 190 (GA); *Moore* 194 (GA); Jones Co.: *Moore* 259 (GA). NORTH CAROLINA. Stokes Co.: *Moore* 238 (GA). Yadkin Co.: *Moore* 241 (GA). SOUTH CAROLINA. Spartanburg Co.: *Moore* 819 (GA). TENNESSEE. Lawrence Co.: *Sharpe et al.* 9700 (TENN). VIRGINIA. Albemarle Co.: *Massey* 4579 (BH). Roanoke Co.: *Wertz s.n.* (MO).

VITIS CINEREA (Engelm. in Gray) Engelm. ex Millardet var. **HELLERI** (Bailey) M.O. Moore, comb. nov. — BASIONYM: *V. cordifolia* var. *belleri* Bailey, Gray's Syn. Fl. N. Amer. 1:424. 1897. *V. helleri* (Bailey) Small, Fl. SE U.S. 754:1334. 1903. — TYPE: TEXAS. KERR CO.: 1600–2000 ft., 14–21 May 1894, *Heller* 1750 (LECTOTYPE, here designated: BH!; ISOLECTOTYPES: BH!, as photos BH!).

V. berlandieri Planchon, Compt. Rend. Hebd. Seances Acad. Sci. 91:425. 1880. *V. cinerea* var. *berlandieri* (Planchon) Comeaux, Proc. Texas Grape Growers Assoc., 1986. 1987, *nom. illeg.* — TYPE: NEW MEXICO and TEXAS, 1834, *Berlandier* 2412 (HOLOTYPE: PH!).

Similar in appearance to *V. cinerea* var. *cinerea*, but differing by having berries that are moderately to heavily glaucous, branchlets of the season that generally lack hirtellous pubescence and are not as prominently angled, and leaf blades that are usually less than 10 cm long with undersurfaces that are only sparsely hirtellous pubescent (or glabrate). Inhabiting a variety of moist habitats, floodplains, lowland woods, stream and

pond margins. (TX, most common on the Edwards Plateau, but also found in the Cross Timbers and Prairies and the Blackland Prairies). This variety intergrades with *V. cinerea* var. *cinerea* southwest of the Brazos River (Comeaux, 1987a).

Comeaux (1987a) combined this taxon with *V. cinerea* as *V. cinerea* var. *berlandieri* (Planchon) Comeaux. However, in doing so, no clear indication of the basionym was given as is required under article 33.2 of the International Code of Botanical Nomenclature and thus the name was not validly published. Nevertheless, the name "var. *belleri*" is the oldest varietal name attributable to this taxon and therefore must be used if this taxon is recognized at the varietal level and if *V. cordifolia* var. *belleri* is considered as a synonym of it. Gandhi and Brown (1989), however, did not accept Comeaux's treatment and preferred recognizing this taxon as a distinct species. Present evidence justifies the treatment of this taxon as a variety of *V. cinerea*.

Representative specimens examined: TEXAS. Bandera Co.: Moore 683 (GA). Coryell Co.: Moore 943 (GA); Moore 944 (GA). Kendall Co.: Moore 682 (GA). Kerr Co.: Correll & Johnston 17231 (TEX). Real Co.: Moore 691 (GA); Cory 19088 (GH). Travis Co.: Ripperton & Barkley 14522C (OKL). Uvalde Co.: Moore 958 (GA); Moore 689 (GA).

Subgenus **VITIS**, Series **CORDIFOLIAE** Munson, U.S.D.A. Div. Pomol. Bull. No. 3:7. 1890. — TYPE SPECIES: *Vitis cordifolia* Michaux (= *V. vulpina* L.).

VITIS VULPINA L., Sp. Pl. 203. 1753. — TYPE: VIRGINIA (HOLOTYPE: LINN as IDC microfiche, no. 281.7!).

V. cordifolia Michaux, Fl. Bor.-Amer. 2:231. 1803. — LECTOTYPE, here designated: as microfiche IDC Michaux, no. 123, photo 3! (P). — SYNTYPE: as microfiche IDC Michaux, no. 123, photo 4! (P).

V. pullaria LeConte, Proc. Acad. Nat. Sci. Philadelphia 6:273. 1853. — TYPE: VIRGINIA. Norfolk, n.d., John LeConte s.n. (LECTOTYPE, here designated: PH!; ISOLECTOTYPE: PH!).

V. cordifolia var. *foetida* Engelm., Amer. Naturalist 2:231. 1869. — SYNTYPES: not found.

V. cordifolia var. *sempervirens* Munson, Rev. Vitic. 5:165. 1896. *V. illex* Bailey, Gent. Herb. 3:217. 1934. — TYPE: FLORIDA. MANATLÉ CO.: originally from south Florida, cultivated in vineyard of T.V. Munson, 10 May 1890 (LECTOTYPE, here designated: BH!). — SYNTYPES: (BH!).

High climbing vine, branchlets of the season slightly angled when very young but becoming terete, very young stems and emerging leaves glabrous to sparsely arachnoid pubescent. Bark exfoliating in shreds on mature stems, lenticels absent or inconspicuous, pith brown, interrupted by nodal diaphragms, diaphragms 1–2.5 mm thick. Tendrils bifurcate, a tendril or inflorescence present at 2 consecutive nodes only, nodes not

glaucous, not banded with red pigmentation. Leaves with petioles about as long as the blades, sparsely to moderately pubescent with hirtellous trichomes or glabrous; blades cordiform, often 3-shouldered to shallowly 3-lobed, deeply lobed only on ground shoots; margins irregularly dentate-serrate, bases typically cordate, apices acute to short acuminate; upper surface of mature leaves typically glabrous to very sparsely hirtellous pubescent, often lustrous, lower surface not glaucous, typically green, with short, straight hirtellous pubescence along the veins and in their axils, varying to more or less glabrous, rarely with very sparse arachnoid pubescence; stipules 1.5–3 mm long. Panicles 9–19 cm long, usually narrowly triangular in general outline, infructescences typically with more than 25 berries (or pedicels); 3 or 4 seeded berries 8–12 mm in diameter, black, very slightly, or more typically, not at all glaucous, lenticels absent; seeds dark brown, ovoid, 3–5 mm long.

In upland, well-drained woodlands of various mixtures, woodland borders, fence and hedge rows, thickets, less commonly in floodplains or lowland woods (se NY to MO and e KN, generally southward to peninsular FL and nc TX). Flowering in May; fruit ripening July to August.

Representative specimens examined: ARKANSAS. Marion Co.: *Moore 301* (GA). FLORIDA. Dixie Co.: *Moore 317* (GA); Gadsden Co.: *Moore 798* (GA). ILLINOIS. Shelby Co.: *Moore 1050* (GA). MISSOURI. Howard Co.: *Moore 1033* (GA). NORTH CAROLINA. Brunswick Co.: *Moore 374* (GA). OKLAHOMA. McCurtain Co.: *Moore 716* (GA). TENNESSEE. Carter Co.: *Moore 251* (GA); Rutherford Co.: *Moore 273* (GA). VIRGINIA. *Moore 835* Nelson Co.: (GA).

VITIS PALMATA Vahl, *Symb. Bot.* 3:42–43. 1794. — TYPE: VIRGINIA: in Virginiana, n.d., no collector (LECTOTYPE, here designated: C!). — SYNTYPE: (C!).

V. rubra Michaux ex Planchon, in *DC Monogr. Phan.* 5:344. 1887. — LECTOTYPE, here designated: as microfiche IDC Michaux, no. 123, photo 2! (P). — SYNTYPE: as microfiche IDC Michaux, no. 123, photo 5! (P).

Relatively slender, high climbing vine, the branchlets of the season subterete and usually entirely dark crimson or purplish-red until mature, upon maturity the branches then of a reddish-brown to chestnut color, glabrous to very thinly arachnoid. Bark exfoliating in shreds on mature stems, pith brown, interrupted by nodal diaphragms, diaphragms 2.5–4 mm thick. Tendrils bifurcate, red-pigmented when young, a tendril or inflorescence present at only 2 consecutive nodes, nodes not glaucous. Leaves with slender petioles that are somewhat shorter than the blades, glabrous to puberulent; blades generally cordiform, commonly deeply 3 (5) lobed, the lobes attenuate acuminate, sinuses acute to rounded; margins dentate-serrate; upper surface of mature leaves glabrous, lower

surface not glaucous, glabrous or pubescent with only hirtellous trichomes along the veins and in their axils; stipules 1.5–3 mm long. Panicles 6–18 cm long, usually narrowly triangular in outline, infructescences usually with more than 25 berries; 3 or 4 seeded berries 8–10 mm in diameter, bluish-black to black, with very little or no glaucescence, lenticels absent. Seeds dark brown, globose, 4–7 mm long, nearly filling the berry.

River banks and alluvial floodplain woodlands (IL and IN south to MO, TX, wc AL, c panhandle of FL). Flowers the latest of all native species, mid to late June; fruit ripening late July to October.

Representative specimens examined: ALABAMA. Hale Co.: *Glenboski* 49 (UNA). FLORIDA. Gadsden Co.: *Moore* 797 (GA); *Moore* 802 (GA). INDIANA. Knox Co.: *Deam* 24145 (US). Posey Co.: *Tryon* 4256 (US); *Deam* 39930 (GH). LOUISIANA. Ouchita Parish: *Thieret* 20841 (FSU); *Smith* 458 (TENN). MISSISSIPPI. LeFlore Co.: *Moore* 347 (GA). Neshoba Co.: *Smith* 883 (FSU).

VITIS MONTICOLA Buckley, Proc. Acad. Nat. Sci. Philadelphia 62:450. 1861. *V. aestivalis* var. *monticola* (Buckley) Engelm., Amer. Naturalist 2:321. 1869. — TYPE: TEXAS. HAYS CO.: *Crescit* in Texas, n.d., *B. Buckley s.n.* (LECTO-TYPE, here designated: US!). — SYNTYPE: (PH!).

High climbing vine, branchlets of the season angled when young but becoming terete at maturity, young stems and leaves slightly to moderately arachnoid pubescent. Bark exfoliating in shreds on mature stems, lenticels absent or inconspicuous, pith brown, interrupted by nodal diaphragms, diaphragms 1–2.5 mm thick. Tendrils bifurcate, a tendril or inflorescence present at only two consecutive nodes, nodes not glaucous, usually not banded with red pigmentation (but occasionally the red-banding present). Leaves with petioles about half as long as the blade, sparsely to moderately pubescent with arachnoid trichomes, glabrate at maturity; blades cordiform, often 3-shouldered to shallowly 3-lobed; margins irregularly dentate-serrate, bases typically cordate, apices acute to short acuminate (occasionally long acuminate); upper surface of mature leaves typically glabrous, usually lustrous, lower surface not glaucous, typically green, glabrous to sparsely hirtellous pubescent; stipules 1.5–3 (–4) mm long. Panicles 3–7 cm long, usually globose in general outline, infructescences typically with less than 25 berries (or pedicels); 3 or 4 seeded berries 8–10 mm in diameter, black, very slightly, or more typically, not at all glaucous, lenticels usually present. Seeds dark brown, ovoid, 5–7 mm long.

In upland, well-drained habitats of various mixtures. Endemic to the Edwards Plateau in sc TX. Flowering in May, fruit ripening July to August.

Representative specimens examined: TEXAS. Bandera Co.: *Moore* 935 (GA). Bexar Co.: *Clare* 641 (BH). Blanco Co.: *Whitehouse* 546 (NY). Comal Co.: *Palmer* 12181 (GH-A). Kendall Co.: *Palmer* 13651 (GH). Kerr Co.: *Moore* 962 (GA); *Cory* 24043 (BH). Llano Co.: *Ramsey* s.n. (NY). Real Co.: *Cory* 42700 (TEX); *Cory* 42701 (GH).

Subgenus **VITIS**, Series **LABRUSCAE** Planchon, in DC Monogr. Phan. 5:323. 1887. — TYPE SPECIES: *Vitis labrusca* L.

VITIS LABRUSCA L., Sp. Pl. 202. 1753. — TYPE: America Septentrionali (LECTOTYPE, here designated: LINN, as IDC microfiche no. 81.5!). — SYNTYPE: LINN, as IDC microfiche no. 281.6!.

V. labrusca var. *labruscoides* Eaton, Man. Bot. 496. 1818. — SYNTYPES: not seen.

V. labrusca var. *alba* Prince, Treatise on the Vine 181. 1830. *V. labrusca* forma *alba* (Prince) Fernald, Rhodora 41:431. 1941. — SYNTYPES: not seen.

V. labrusca var. *rosea* Prince, Treatise on the Vine 182. 1830. — SYNTYPES: not seen.

V. labrusca var. *subdentata* Fernald, Rhodora 42:462–463. 1940. — TYPE: VIRGINIA. CHARLES CITY CO.: swampy thickets southeast of Charles City, 22 Aug 1939, M. Fernald and B. Long 11074 (HOLOTYPE: GH!; ISOTYPES: GH! NY! PH! US!).

High climbing vine, branchlets of the season obscurely angled when young, becoming terete at maturity, young stems and leaves densely tomentose, occasionally with spinose pubescence with glandular tips. Bark exfoliating in shreds on mature stems, lenticels inconspicuous or absent, pith brown, interrupted by nodal diaphragms, diaphragms 0.5–2.5 mm wide. Tendrils bifurcate to occasionally trifurcate, continuous, a tendril or inflorescence present opposite virtually every node, occasionally absent opposite lowermost nodes, nodes not glaucous, not banded with red pigmentation. Leaves with petioles about as long as the blades, thinly arachnoid pubescent to glabrous; blades cordiform, often 3-shouldered; margins crenate to crenate-dentate, bases typically cordate, apices usually acute; upper surfaces of mature leaves glabrous to slightly pubescent, dull, lower surface not glaucous, typically whitish to yellowish due to dense arachnoid tomentum which obscures the leaf undersurface but not the veins; stipules 2–4 mm long. Panicles 6–14 cm long, usually globose to cylindrical in general outline; infructescences usually with less than 25 berries, occasionally with less than 12. Berries greater than 12 mm in diameter, black, very slightly, or more typically, not at all glaucous, lenticels absent. Seeds brown, obcordate, 5–8 mm long.

Inhabiting a very wide variety of sites, both upland and well drained and lowland and poorly drained, including intermittently flooded bottomlands (ME, NH and VT south to n GA, n AL, n MS, north to ne AR, se MO, e IL and s MI). Flowering in May to June, fruit ripening in September to October.

Representative specimens examined: GEORGIA. Rabun Co.: *Jones* 23662 (GA). INDIANA. Porter Co.: *Dean* 29810 (IND). MAINE. Oxford Co.: *Moore* 855 (GA). PENNSYLVANIA. Fayette Co.: *Moore* 881 (GA). Pike Co.: *Moore* 846 (GA). TENNESSEE. Cooke Co.: *Hannewell* 14254 (GH). VIRGINIA. Carroll Co.: *Moore* 231 (GA); Carroll Co.: *Moore* 245 (GA). Nelson Co.: *Moore* 836 (GA). Norfolk Co.: *Moore* 378 (GA).

VITIS SHUTTLEWORTHII House, Amer. Midl. Naturalist 7:129. 1921. *V. cortacea* Shuttlew. ex Planchon, in DC Monogr. Phan. 5:345. 1887, *nom. illeg.*, non Miq. 1863. *V. candicans* var. *cortacea* (Shuttlew. ex Planchon) Bailey ex Gray, Syn. Fl. N. Amer. 1:429. 1897. — TYPE: FLORIDA. borders of the Manatee River, Jun 1845, *Rugel* 111 (HOLOTYPE: BM!).

Moderately high climbing vigorous vine, branchlets of the season oval to terete, densely tomentose when young, becoming more thinly tomentose with age. Bark exfoliating in shreds on 2 year old stems, lenticels absent or inconspicuous, pith brown, interrupted by diaphragms at nodes, diaphragms typically 2.5–6 mm thick but frequently continuing halfway into the internode. Tendrils bifurcate to trifurcate, a tendril or inflorescence present opposite only 2 consecutive nodes, nodes not glaucous, not banded with red pigmentation. Leaves with petioles about half to three quarters the length of the blade, densely tomentose; blades broadly cordate to nearly reniform, typically unlobed but varying to 3-shouldered or, less often, deeply 3–5 lobed, when lobed the lobes acute and the sinuses rounded; margins with shallow, broad scalloped, obtuse teeth, typically nearly entire, leaf bases cordate to truncate; upper surface of mature leaves floccose to glabrous, lower surface not glaucous but densely and evenly covered with white to rusty tomentum, typically concealing the leaf under-surface but not always the veins; stipules minute, less than 1 mm long, promptly deciduous. Panicles 4–10 cm long, the rachis arachnoid floccose, usually broadly short triangular in outline, infructescences with less than 25 berries, occasionally with less than 12. Berries large, greater than 12 mm in diameter, dark red to purple-black, with little or no glaucescence, lenticels absent. Seeds dark brown, ovoid to rounded, 5–6 mm long.

Generally found in woodlands of various mixtures, woodland borders, thickets and lowland woods in peninsular FL (endemic to peninsular FL). Flowering in early April to early May, fruit ripening in June to August.

Representative specimens examined: FLORIDA. Citrus Co.: *Moore* 776 (GA). Charlotte Co.: *Moore* 753 (GA). Collier Co.: *Moore* 760 (GA). DeSoto Co.: *Moore* 752 (GA). Glades Co.: *Moore* 749 (GA). Hardee Co.: *Moore* 322 (GA). Hillsborough Co.: *Pardue s.n.* (USF). Manatee Co.: *Moore* 786 (GA). Sarasota Co.: *Moore* 787 (GA); *Moore* 788 (GA).

VITIS MUSTANGENSIS Buckley, Proc. Acad. Nat. Sci. Philadelphia 62:451. 1861. — TYPE: TEXAS. Near Austin, Apr 1860, *S.B. Buckley s.n.* (LECTOTYPE, here designated: PH!). — SYNTYPE: (US!).

High climbing vigorous vine, branchlets of the season oval to terete, densely tomentose when young, becoming more thinly tomentose with age. Bark exfoliating in shreds on 2 year old stems, lenticels absent or inconspicuous, pith brown, interrupted by diaphragms at nodes, diaphragms 1.5 – 3 mm thick. Tendrils bifurcate to trifurcate, a tendril or inflorescence present opposite only 2 consecutive nodes, nodes not glaucous, not banded with red pigmentation. Leaves with petioles about half to three quarters the length of the blade, densely tomentose; blades broadly cordate to nearly reniform, usually concavely folded, typically unlobed but varying to 3-shouldered or deeply 3 – 5 lobed, when lobed the lobes acute and the sinuses rounded; margins with shallow, broad scalloped, obtuse teeth, typically nearly entire, leaf bases cordate to truncate; upper surface of mature leaves floccose to glabrous, lower surface not glaucous but densely and evenly covered with white to rusty tomentum, typically concealing the leaf undersurface but not always the veins; stipules 1.5 – 4 mm long, promptly deciduous. Panicles 4 – 10 cm long, the rachis arachnoid floccose, usually broadly short triangular in outline, infructescences with less than 25 berries, occasionally with less than 12. Berries large, greater than 12 mm in diameter, black to less commonly dark red, with little or no glaucescence, lenticels absent. Seeds dark brown, ovoid to rounded, 6 – 7 mm long.

Generally found in woodlands of various mixtures, woodland borders, thickets and lowland woods (e TX and extreme w LA north to s OK, with one disjunct population in Wilcox County, AL). Flowering in late May to early June, fruit ripening in August to September.

In several early publications (e.g., Munson 1909; Bailey 1934), this species was known as *V. candicans* Engelm. ex Gray. Engelmann and Gray published this name in 1850, but the description of this taxon was quite vague, stating only that "Under the name of *V. candicans* (n.sp.) Engelm. ined., I have from Lindheimer, as also from Mr. Wright, Texan specimens of what appears to be a variety of *V. californica* Benth., with the leaves somewhat less dentate and more densely tomentose underneath". Additionally, it is not at all clear how Gray is treating the above description, as he did not list it as a new species, but rather included it under what appears to be the description of a new variety of *V. aestivalis*. However, Gray did not give this apparent new variety a name but only states "var. *tomento albo, nec fulvo*. Shady banks of streams, New Braunfels. Climbing high trees. Berries the size of peas, in large bunches, black; the taste vinous and

pleasant. Flowers very odorous." Thus, the name *V. candicans* must be considered ambiguous, making the name *V. mustangensis* the valid and legitimate one for this species.

Representative specimens examined: ALABAMA. Wilcox Co.: *Moore* 728 (GA). OKLAHOMA. Marshall Co.: *Goodman* 5858 (GH). TEXAS. Anderson Co.: *Moore* 932 (GA). Comal Co.: *Moore* 687 (GA). Gonzales Co.: *Webster & Wilbur* 2977 (SMU). Grayson Co.: *Moore* 713 (GA). Hays Co.: *Moore* 686 (GA). Leon Co.: *Moore* 935 (GA). Llano Co.: *Moore* 964 (GA). Mason Co.: *Moore* 693 (GA).

Subgenus *VITIS*, Series *RIPARIAE* Munson, U.S.D.A. Div. Pomol. Bull. No. 3:7. 1890. — TYPE SPECIES: *V. riparia* Michaux.

VITIS ACERIFOLIA Raf., Amer. Man. Grape Vines 14. 1830. — NEOTYPE, here designated: TEXAS. WILBARGER CO.: growing along Beaver Creek on US 283, S of Vernon, in a rest area 1.5 mi S of jct. with Farm Road 1763, 13 Jun 1986, *Moore* 700 (GA!; ISONEOTYPES: PH!, US!). — SYNTYPES: not found.

V. longii Prince, Treatise on the Vine 184. 1830. — SYNTYPES: not seen.

V. solonis Hort. Berol. ex Planchon, Vignes Amer. 119. 1875. *V. cordifolia* var. *solonis* (Hort. Berol. ex Planch) Planchon, Vignes Amer. 118. 1875. — SYNTYPES: not found.

V. nuevo-mexicana Lemmon ex Munson, Trans. Amer. Hort. Soc. 3:132. 1885. — SYNTYPES: not found.

V. solonis var. *microsperma* Munson, Rev. Vitic. 3:158. 1895. *V. longii* var. *microsperma* (Munson) Bailey ex Gray, Syn. Fl. N. Amer. 1:423. 1897. — SYNTYPES: not found.

Typically a stocky, erect, shrubby, much branched low to moderately high climbing vine, branchlets of the season slightly angled when young but becoming terete, very young stems and leaves whitish arachnoid pubescent, mature stems glabrous to arachnoid pubescent. Bark closely persistent for several years, then shredding in thin plates, lenticels absent or inconspicuous, pith brown, interrupted by nodal diaphragms, diaphragms usually less than 1.0 mm wide. Tendrils bifurcate, a tendril or inflorescence present at only two consecutive nodes, nodes not glaucous, not banded with red pigmentation. Leaves with petioles about half as long as the blades, often partially conduplicate folded, typically moderately to thinly arachnoid pubescent to glabrate; blades broadly cordate, often 3-shouldered to shallowly 3-lobed; margins sharply dentate-serrate, bases typically broadly cordate, apices typically short acuminate; upper surface of mature leaves slightly arachnoid pubescent to glabrate, lower surface not glaucous, slightly arachnoid pubescent but also with sparse hirtellous pubescence along the veins, varying to glabrate; stipules 3–6 mm long. Panicles 5–9 cm long, compact, globose in general outline, infructescences typically short pedunculate, making the clusters appear almost sessile, typically with greater than 25 berries, but occasionally with

only 12 to 25; 3 or 4 seeded berries 8–12 mm in diameter, black, heavily glaucous, lenticels absent. Seeds reddish-brown, pyriform, 5–6 mm long.

Inhabiting moist to slightly drier sites, river banks and alluvial flood-plain woodlands, but also along hedge rows and fence rows (nc TX, ne NM, se CO, sw KN, w OK). Flowering in April to May, fruit ripening in July to August.

In earlier treatments of the genus, (e.g., Munson 1909; Bailey 1934), this species was known as *V. longii* Prince. Since both *V. acerifolia* and *V. longii* were published in 1830, Bailey (1934) stated that he could not choose between the two names and that both descriptions were equally good. Since Prince had the species in fruit, while Rafinesque apparently did not, and since the name "*longii*" had been used for many years, Bailey decided to continue using that name. However, Rehder (1946) later determined that Rafinesque's publication was dated May, 1830 in the preface while the copyright date of Prince's publication was September, 1830. Thus, the name "*acerifolia*" has priority over the name "*longii*."

Representative specimens examined: OKLAHOMA. Custer Co.: *Moore* 708 (GA). Dewey Co.: *Nelson* 6095 (OKL). Grady Co.: *Moore* 978 (GA). Harmon Co.: *Moore* 701 (GA). Washita Co.: *Moore* 707 (GA). Woodward Co.: *Moore* 702 (GA). TEXAS. Collingsworth Co.: *Moore* 697 (GA). Donley Co.: *Moore* 698 (GA). Hemphill Co.: *Cory* 16224 (BH). Willbarger Co.: *Moore* 700 (GA).

VITIS RIPARIA Michaux, Fl. Bor.-Amer. 2:231. 1803. *V. cordifolia* var. *vulpina*, (L.) Eaton, Man. Bot. 497. 1818. *V. cordifolia* var. *riparia* (Michaux) Gray, Manual ed. 5:113. 1867. *V. vulpina* ssp. *riparia* (Michaux) Clausen, Cornell Univ. Agric. Exp. Sta. Mem. 298:8. 1949. — TYPE: ad ripas et in insulis fluviorum Ohio, Mississippi, etc. (HOLOTYPE: as microfiche, IDC Michaux no. 122, photo 19, bottom specimen! P).

V. riparia var. *praecox* Engelm. ex Bailey, Amer. Garden 14:353. 1893. — SYNTYPES: not found.

V. vulpina var. *syrticola* Fernald and Weigand, Rhodora 25:212. 1923. *V. riparia* var. *syrticola* (Fernald and Weigand) Fernald, Rhodora 41:431. 1931. — TYPE: NEW YORK. OSWEGO CO.: Selkirk, sand dunes overlying Silurian shales and schists by Lake Ontario, 23 Aug 1922, Fernald, Weigand and Eames 14388 (HOLOTYPE: GH!; ISOTYPE: GH!).

Moderate to high climbing vine, branchlets of the season terete, young stems and leaves glabrous to slightly hirtellous pubescent (varying to slightly arachnoid pubescent in some Louisiana specimens). Bark exfoliating in shreds on mature stems, lenticels absent or inconspicuous, pith brown, interrupted by nodal diaphragms, diaphragms usually less than 0.5 mm wide. Tendrils bifurcate, a tendril or inflorescence present at only two consecutive nodes, nodes not glaucous, not banded with red pigmen-

tation. Leaves with petioles about half as long as the blades, slightly to moderately hirtellous pubescent; blades cordiform, 3-shouldered to shallowly 3-lobed, margins sharply dentate-serrate, bases typically cordate, apices typically short acuminate; upper surface of mature leaves glabrous, often light yellowish-green, lower surface not glaucous, typically green and with hirtellous trichomes along the veins and in their axils, varying to glabrate; stipules 3–5 mm long. Panicles 7–12 cm long, usually narrowly triangular in general outline, infructescences typically with more than 25 berries; 3 or 4 seeded berries 8–12 mm in diameter, black, heavily glaucous, lenticels absent. Seeds dark brown, pyriform, 5–6 mm long.

Inhabiting a wide variety of habitats but preferring moist soils, stream banks, pond margins, alluvial woodlands but also on roadsides, hedge rows and fence rows (s New Brunswick west to se Saskatchewan, south to n VA, w TN, n MS, LA, e TX, north to e KN, e NB, e SD and e ND. Also reported from the Pacific Northwest). Flowering in April to June, fruit ripening in August to September.

Representative specimens examined: ARKANSAS. Miller Co.: *Moore* 724 (GA). IOWA. Davis Co.: *Moore* 1041 (GA). Van Buren Co.: *Moore* 1042 (GA). MISSOURI. Pettis Co.: *Moore* 1035 (GA). NEW YORK. Herkimer Co.: *Moore* 870 (GA). Schuyler Co.: *Moore* 875 (GA). Sullivan Co.: *Moore* 847 (GA). Warren Co.: *Moore* 869 (GA). VERMONT. Addison Co.: *Moore* 868 (GA). Caledonia Co.: *Moore* 865 (GA).

VITIS RUPESTRIS Scheele, *Linnaea* 21:591. 1848. — NEOTYPE, here designated: MISSOURI. DENT Co.: all around gravel bed deposits covering large area around Meramec River Headwaters, T33N, R4W, sect. 14, 2 mi SE of Max, 10 Aug 1936, J. A. Steyermark 12842 (MO!). — SYNTYPES: not found.

V. rupestris var. *dissecta* Eggert ex Bailey in Gray, *Syn. Fl. N. Amer.* 1:422. 1897. *V. rupestris* forma *dissecta* (Eggert ex Bailey in Gray) Fernald, *Rhodora* 41:431. 1941. — TYPE: MISSOURI. JEFFERSON Co.: brooks on hillsides, 22 May 1892, Eggert s.n. (LECTOTYPE, here designated: NY!; ISOLECTOTYPES: FL, US!).

Sprawling to low climbing, much branched vine, branchlets of the season slightly angled but becoming terete at maturity, very young stems and leaves glabrous or slightly hirtellous pubescent. Bark persistent for the first several years, then shredding in plates, lenticels absent or inconspicuous, pith brown, interrupted by nodal diaphragms, diaphragms less than 1 mm wide. Tendrils bifurcate, commonly present only opposite the uppermost nodes and then only at two consecutive nodes, nodes not glaucous, not banded with red pigmentation. Leaves with petioles about half as long as the blades, glabrous to slightly hirtellous pubescent; blades typically reniform, conduplicately folded, particularly when young, often 3-shouldered, rarely shallowly 3-lobed; margins dentate-serrate, bases typi-

cally truncate to broadly cordate, apices acute to short acuminate; upper surface of mature leaves typically glabrous, often lustrous, lower surface not glaucous, typically green and glabrous, occasionally with sparse hirtellous pubescence along the veins and in their axils; stipules 3–6.5 mm long. Panicles 4–7 cm long, usually globose in general outline, infructescences typically with less than 25 berries, occasionally with less than 12; 3 or 4 seeded berries 8–12 mm in diameter, black, slightly glaucous, lenticels absent. Seeds light brown, ovoid, 5–6 mm long.

Herbarium records indicate that this species was once distributed from south central Texas, through northern Arkansas, Missouri, northern Tennessee, Kentucky and northern West Virginia and northwestern Maryland to southwestern Pennsylvania. It has apparently been extirpated from many of these regions and is now only found along calcareous, gravelly banks, river bottoms, stream beds and washes in south central Missouri and extreme northern Arkansas. Flowering in April to May, fruit ripening in August to September. It is a critical species as it is important in viticulture as a rootstock.

Representative specimens examined: MARYLAND. Montgomery Co.: *Steele s.n.* (NY). MISSOURI. Oregon Co.: *Palmer & Steyermark 41716* (MO). Phelps Co.: *Eggert s.n.* (BH). Iron Co.: *Palmer 18103* (GH). PENNSYLVANIA. Lane Co.: *Porter s.n.* (NY). OKLAHOMA. Comanche Co.: *Demaree 13141* (GH). TENNESSEE. Davidson Co.: *Gattinger 460A* (GH). TEXAS. Johnson Co.: *Reverchon s.n.* (SMU). Tarrant Co.: *Ruth 368* (US). Tom Green Co.: *Tweedy 134* (US).

HYBRIDS

Vitis × champinii Planchon (*pro. sp.*), *Vigne Amer.* 6:22. 1882. — NEOTYPE, here designated: TEXAS. GRAYSON Co.: originally from Llano County, cultivated Denison, Texas, Munson vineyard, 25 Apr 1890, *F.M. Ramsey s.n.* (NY!; ISONEOTYPE: MO!) — SYNTYPES: not found.

High climbing vine, branchlets of the season somewhat angled when young, becoming terete when mature, young stems and leaves arachnoid pubescent, becoming glabrate with age. Bark tardily exfoliating in shreds, lenticels absent or inconspicuous, pith brown, interrupted by nodal diaphragms, diaphragms 1.5–2.5 mm thick. Tendrils bifurcate, rarely trifurcate, a tendril or inflorescence present at only two consecutive nodes, nodes not glaucous, not banded with red pigmentation. Leaves with petioles about half as long as the blade, thinly arachnoid pubescent to less commonly glabrous; blades cordate to occasionally nearly reniform, often 3-shouldered to very shallowly 3-lobed, occasionally partially conduplicate; margins crenate to slightly serrate, bases typically cordate, apices acute to short acuminate; upper surface of mature leaves typically glabrous, often lustrous, lower surface not glaucous, typically green, thinly arach-

noid pubescent to glabrate; stipules 2.0–5.5 mm long. Panicles 3–7 cm long, usually globose in general outline, infructescences usually with less than 25 berries (or pedicels); 3 or 4 seeded berries greater than 12 mm in diameter, black, very slightly, or more typically, not at all glaucous, lenticels absent. Seeds brown, ovoid, 5–6 mm long.

Inhabiting well drained calcareous soils in sc Texas, on and adjacent to the Edwards Plateau. Flowering in April to May, fruit ripening in July to August. Interpreted here as a hybrid between *V. mustangensis* and *V. rupestris*, Comeaux (pers. comm.), however, presently feels that the origin of this taxon may be more complicated. It is now rare in nature (Comeaux, 1987b).

Representative specimens examined: NORTH CAROLINA. *Williams* 63, cultivated, Wake Co. (BH). TEXAS. Burnet Co.: Biltmore Herbarium 14842 (US). Bell Co.: *W.B. Munson* s.n. (BH). Travis Co.: *Munson* s.n. (MO). Southwestern Texas, *Munson* s.n., (US). Originally from Coryell County, *Moore* 1062, (GA). Cultivated, Denison, *Munson* s.n., (BH); cultivated, Denison, *Munson* s.n., (MOR). Originally from Llano County, *Munson* s.n., (MO). No collector, no number, no location (29 May 1896) (BH).

Vitis × **doaniana** Munson ex Viala (*pro. sp.*), Mission Vitic. Amér. 101.

1889. — TYPE: TEXAS. WILBARGER CO.: Wilbarger County, 1886, cultivated in the Munson vineyard, Denison, 24 Apr 1890, *T.V. Munson* s.n. (LECTOTYPE, here designated: NY!). — SYNTYPES: (CU! BH! FLAS! US!).

High climbing vine, but shrubby and sprawling without support, branchlets of the season terete when mature, young stems and leaves densely tomentose. Bark tardily exfoliating in shreds, lenticels absent or inconspicuous, pith brown, interrupted by nodal diaphragms, diaphragms 1–2 mm thick. Tendrils bifurcate to occasionally trifurcate, a tendril or inflorescence present at only two consecutive nodes, nodes not glaucous, not banded with red pigmentation. Leaves with petioles about half as long as the blades, thinly arachnoid pubescent; blades cordate, often 3-shouldered to shallowly 3-lobed; margins crenate to crenate-serrate, bases typically cordate, apices acute to short acuminate; upper surface of mature leaves slightly to moderately arachnoid pubescent, lower surface not glaucous, typically dull green, slightly to moderately arachnoid pubescent; stipules 3–6 mm long. Panicles 4–10 cm long, usually globose to short triangular in outline, infructescences with less than 25 berries (or pedicels); 3 or 4 seeded berries greater than 12 mm in diameter, black, heavily glaucous, lenticels absent. Seeds dark brown, ovoid, 6–7 mm long.

Inhabiting well-drained, drier soils in sand hills, plains and timber regions (n TX to s OK). Flowering in April to May, fruit ripening in July to August. A hybrid between *V. mustangensis* and *V. acerifolia*, once more

common in nature than it is at present, that was named for Judge J. Doan of Wilbarger County, Texas, who manufactured wine from the berries of this species. The town of Doans in Wilbarger County is named after Judge Doan where populations of this hybrid can still be found.

Representative specimens examined: MASSACHUSETTS. cultivated, Arnold Arboretum, *Palmer s.n.*, (MOR). NEW YORK. Ontario Co.: cultivated, *Bean 668* (BH). OKLAHOMA. Tillman Co.: *Moore 975* (GA). TEXAS. Wilbarger Co.: *Moore 974* (GA); *Manson s.n.* (NY). Cultivated, Denison, 6 May 1891 *Manson s.n.* (BH); cultivated, Denison, Aug 1891 *Manson s.n.* (BH); cultivated Denison, *Manson s.n.* (BH); cultivated Denison, originally from Wilbarger Co.: 24 Apr 1890 *Manson s.n.* (BH); cultivated, Denison, 7 Aug 1895 *Manson s.n.* (BH).

Vitis × **novae-angliae** Fernald (*pro. sp.*), *Rhodora* 19:146. 1917. — TYPE: MAINE. PENOBSCOT CO.: thicker by river, Orono, 27 Jun 1906, *M.L. Fernald s.n.* (LECTOTYPE, here designated; GH!; ISOLECTOTYPES: GH! NY! PH!). — SYNTYPE: (GH!). — PARATYPES: (GH!, PH!).

High climbing vine, branchlets of the season terete at maturity, young stems and leaves densely tomentose. Bark exfoliating in shreds on mature stems, lenticels inconspicuous or absent, pith brown, interrupted by nodal diaphragms, diaphragms 0.3–1.1 mm thick. Tendrils bifurcate, continuous, a tendril or inflorescence present at three to several consecutive nodes, but frequently not present opposite all nodes as in *V. labrusca*, nodes not glaucous, not banded with red pigmentation. Leaves with petioles one half to nearly as long as the blades, sparsely arachnoid pubescent to glabrate; blades cordiform, often 3-shouldered; margins crenate to irregularly dentate-serrate, bases typically cordate, apices acute to short acuminate; upper surface of mature leaves typically glabrous, lower surface not glaucous, typically green when mature, more or less densely arachnoid pubescent on young but expanded leaves, only slightly arachnoid pubescent on fully mature leaves; stipules 2.5–6.0 mm long. Panicles 7–13 cm long, usually triangular in general outline, infructescences typically with more than 25 berries, but occasionally with only 12 to 25; 3 or 4 seeded berries greater than 12 mm in diameter, black, slightly glaucous, lenticels absent. Seeds brown, 6–8 mm long.

Thickets, largely alluvial, as well as roadsides, pond and stream margins, and fence and hedge rows (s ME south to n PA and n NJ). Flowering in June, fruit ripening in August to September. A hybrid between *V. labrusca* and *V. riparia* that is common in the New England region.

Representative specimens examined: MAINE. Franklin Co.: *Moore 852* (GA); *Knoulton s.n.* (USF). Waldo Co.: *Seymour 30055* (VT). MASSACHUSETTS. Middlesex Co.: *Smith s.n.* (MO). Essex Co.: *Williams s.n.* (GH). NEW HAMPSHIRE. Belknap Co.: *Moore 859* (GA). Cheshire Co.: *Batchelder s.n.* (PH). Merrimack Co.: *Moore 856* (GA); *Moore 858* (GA). PENNSYLVANIA. Lackawanna Co.: *Glouwenke 8343* (PH).

Nomina nuda et dubiosa

Names without diagnosis or of such uncertainty as not to be cited confidently in regular synonymy.

- V. amara* Raf., Amer. Man. Grape Vines 16. 1830.
- V. americana* Bartram, Med. Rep. hexade 2, vol. 1:21. 1804.
- V. angulata* Raf., Amer. Man. Grape Vines 17. 1830.
- V. bicolor* LeConte, Proc. Acad. Nat. Sci. Philadelphia 6:272. 1853.
- V. bifida* Raf., Amer. Man. Grape Vines 12. 1830.
- V. blanda* Raf., Amer. Man. Grape Vines 12. 1830.
- V. boulderensis* Daniels, Univ. Missouri Stud., Sci. Ser. 2(2):159. 1911.
- V. bracteata* Raf., Amer. Man. Grape Vines 9. 1830.
- V. bracteata* LeConte, Proc. Acad. Nat. Sci. Philadelphia 6:271. 1853.
- V. caerulea* Munson ex Viala, Mission Vitic. Amér. 113. 1889.
- V. callosa* Raf., Amer. Man. Grape Vines 9. 1830.
- V. campestris* Bartram, Travels Carolina 400. 1791.
- V. candicans* Englem. ex Gray, Boston J. Nat. Hist. 6:166. 1850.
- V. canina* Raf., Amer. Man. Grape Vines 11. 1830.
- V. ciliata* Raf., Amer. Man. Grape Vines 13. 1830.
- V. columbina* Raf., Amer. Man. Grape Vines 15. 1830.
- V. concolor* Raf., Amer. Man. Grape Vines 14. 1830.
- V. digitata* Raf., Amer. Man. Grape Vines 9. 1830.
- V. dimidiata* Raf., Amer. Man. Grape Vines 13. 1830.
- V. diversifolia* Prince, Treatise on the Vine 183. 1830.
- V. ferruginea* Raf., Amer. Man. Grape Vines 12. 1830.
- V. floridana* Raf., Amer. Man. Grape Vines 17. 1830.
- V. fulva* Raf., Amer. Man. Grape Vines 8. 1830.
- V. gloriosa* Raf., Amer. Man. Grape Vines 10. 1830.
- V. hyemalis* Raf., Amer. Man. Grape Vines 9. 1830.
- V. illinoensis* Prince, Treatise on the Vine 185. 1830.
- V. incisa* Jacq., Hort. Schoenbr. 4:14. 1804.
- V. integrifolia* Raf., Amer. Man. Grape Vines 18. 1830.
- V. latifolia* Raf., Amer. Man. Grape Vines 10. 1830.
- V. leconteana* House, Amer. Midl. Naturalist 7:128. 1921.
- V. longifolia* Raf., Amer. Man. Grape Vines 13. 1830.
- V. luteola* Raf., Amer. Man. Grape Vines 11. 1830.
- V. missouriensis* Prince, Treatise on the Vine 184. 1830.
- V. nortoni* Prince, Treatise on the Vine 186. 1830.
- V. peltata* Raf., Amer. Man. Grape Vines 17. 1830.
- V. poiretia* Raf., Amer. Man. Grape Vines 18. 1830.
- V. populifolia* Raf., Amer. Man. Grape Vines 15. 1830.
- V. prolifera* Raf., Amer. Man. Grape Vines 18. 1830.
- V. rugosa* Raf., Amer. Man. Grape Vines 11. 1830.
- V. saxatilis* Raf., Amer. Man. Grape Vines 8. 1830.
- V. serotina* Bartram, Med. Rep. hexade 2, vol. 1:22. 1804.
- V. sylvestris* Bartram, Med. Rep. hexade 2, vol. 1:21. 1804.
- V. taurina* Bartram, Med. Rep. hexade 2, vol. 1:22. 1804.
- V. tenuifolia* LeConte, Proc. Acad. Nat. Sci. Philadelphia 6:271. 1853.
- V. ursina* Raf., Amer. Man. Grape Vines 8. 1830.
- V. verrucosa* Raf., Amer. Man. Grape Vines 17. 1830.

Excluded species found in North America north of Mexico.

V. arizonica Engelm. (var. *arizonica* and var. *glabra* Munson)

V. californica Benth

V. girdiana Munson

ACKNOWLEDGEMENTS

I thank the curators and directors of the various herbaria who kindly provided loans of specimens, without which this study would not have been possible. My deepest gratitude is extended to Drs. David E. Giannasi and Samuel B. Jones whose guidance and support throughout the course of the study were truly invaluable. Drs. David M. Hunt, Gerald L. Smith and Robert K. Godfrey as well as Sara L. Moore, Gregory A. Krakow, Angus K. Gholson and Susan L. Sherman-Broyles helped with field work. Anna M. Baker and Dr. Nancy C. Coile provided herbarium support. Dr. Barry L. Comeaux kindly provided plant material, much useful information on the native grapes and a critical review of this manuscript. This research was supported by a National Science Foundation Dissertation Improvement Grant (BSR-8721367) as well as a University of Georgia Botany Department Student Research Grant.

REFERENCES

- BAILEY, L.H. 1934. The species of grapes peculiar to North America. *Gent. Herb.* 3:154–244.
- BARRETT, H.C., S.G. CARMER and A.M. RHODES. 1969. A taximetric study of interspecific variation in *Vitis*. *Vitis* 8:177–187.
- BRIZICKY, G.K. 1965. The genera of Vitaceae in the southeastern United States. *J. Arnold Arbor.* 46:48–67.
- BUCKLEY, S.B. 1861. Descriptions of new plants from Texas. *Proc. Acad. Nat. Sci. Philadelphia* 62:448–451.
- COMEAX, B.L. 1984. Taxonomic studies on certain native grapes of the eastern United States. Ph.D. Thesis, North Carolina State University, Raleigh.
- COMEAX, B.L. 1987a. Overview of the native grapes of Texas. *Proc. Texas Grape Growers Assoc.* 10.
- COMEAX, B.L. 1987b. Studies on *Vitis champinii*. *Proc. Texas Grape Growers Assoc.* 11:158–162.
- COMEAX, B.L. and P.R. FANTZ. 1987. Nomenclatural clarification of *Vitis simpsonii* Munson (Vitaceae). *Sida* 12(2):279–286.
- COMEAX, B.L., W.B. NESBITT and P.R. FANTZ. 1987. Taxonomic studies of the native grapes of North Carolina. *Castanea* 52(3):197–215.
- DEAM, C.C. 1924. Shrubs of Indiana. Indiana Department of Conservation Pub. No. 44.
- DUNCAN, W.H. 1975. Woody vines of the southeastern United States. University of Georgia Press, Athens.
- FERNALD, M.L. 1936. Plants from the outer coastal plain of Virginia. *Rhodora* 38:414–454.
- GALET, P. 1967. Recherches sur les methodes d'identification et de classification des

- Vitaceae des zones temperees. II. These presentee a la Faculte des Sciences de Montpellier, University de Montpellier, France.
- GANDHI, K.N. and L.E. BROWN. 1989. A nomenclatural note on *Vitis cinerea* and *V. berlandieri* (Vitaceae). *Sida* 13(4):506 – 509.
- GODFREY, R.K. and J.W. WOOTEN. 1981. Aquatic and wetland plants of the southeastern United States. Dicotyledons. University of Georgia Press, Athens.
- GRAY, A. 1850. *Plantae Lindheimerianae*, Part II. *Bost J. Nat. Hist.* VI(II):164 – 166.
- GRAY, A. 1867. *Manual of botany of the northern United States* (5th ed.). Ivison, Blake-man and Taylor and Co., New York.
- HOLMGREN, P.K., W. KEUKEN and E.K. SCHOFIELD. 1981. *Index herbariorum*. Part I. *The Herbaria of the World*, 7th ed., *Regnum Veg.* Dr. W. Junk, Boston.
- MCGREGOR, R.L. 1986. Vitaceae. In: *Flora of the Great Plains*. Great Plains Flora Association. University Press of Kansas, Lawrence.
- MATTHEWS, J.E. 1960. A Study of the grapes of the Cayuga Lake region, with emphasis on variation in *V. vulpina* L. M.S. Thesis, Cornell University, Ithaca, NY.
- MOORE, M.O. 1985. A systematic study of selected *Vitis* taxa in the southeastern United States. M.S. Thesis, University of Georgia, Athens.
- MOORE, M.O. 1987. A study of selected *Vitis* (Vitaceae) taxa in the southeastern United States. *Rhodora* 89(857):75 – 91.
- MOORE, M.O. 1988. *Vitis*. In: Godfrey, R.K. *Trees, shrubs and woody vines of northern Florida and adjacent Georgia and Alabama*. University of Georgia Press, Athens.
- MOORE, M.O. 1989. Vitaceae. In: Foote, L.E. and S.B. Jones. *Native shrubs and woody vines of the southeast*. Timber Press, Portland.
- MOORE, M.O. 1990. A systematic study of eastern North American *Vitis* L. (Vitaceae) north of Mexico. Ph.D. Dissertation, University of Georgia, Athens.
- MOORE, M.O. and D.E. GIANNASI. 1987. Foliar flavonoids of selected *Vitis* taxa in the southeastern United States. *Biochem. Syst. Ecol.* 5(1):79 – 83.
- MUNSON, T.V. 1909. *Foundations of American grape culture*. Orange Judd Co., New York.
- PLANCHON, J.E. 1887. Monographie des Ampelidees Vrais. In: *DC Monographie Phan-aerogamarum* 5:305 – 368.
- RADFORD, A.E., H.E. AHLES and C.R. BELL. 1968. *Manual of the vascular flora of the Carolinas*. University of North Carolina Press, Chapel Hill.
- REHDER, A. 1946. Notes on some cultivated trees and shrubs, III. *J. Arnold Arbor.* 27:169 – 174.
- STEYERMARK, J.A. 1963. *Flora of Missouri*. The Iowa State University Press, Ames.